

# The Forceps Operation

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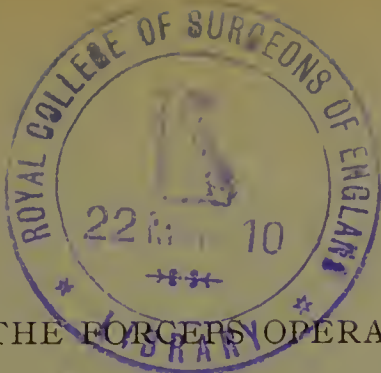
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## THE FORCEPS OPERATION.

WITH REPORT OF METHODS AND AN IMPROVED INSTRUMENT.

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(With fifteen illustrations.)

IMPROPER knowledge and teaching of the technic of the forceps operation in obstetrics is due mainly to the lack of opportunity for demonstration of the operation to the students in their course. The operation is one which is more or less of an emergency operation, and is done most frequently outside of the hospital and under circumstances when it is difficult to dwell upon the procedure of the operation and to properly analyze the steps of its execution. When students attend obstetrical hospitals they see a few forceps operations and those mainly done in the operating room of the hospital where circumstances are much different and the procedure more complicated than when the operation is done in a house. In the hospital, conditions are abnormal; a metal operating table is at hand with iron leg-holders, a large sterilized outfit is convenient, and there are assistants and nurses who obscure to the student the simplicity of the operation.

Hospital conditions are by no means the most advantageous for the forceps operation. A metal operating table with iron stirrups is about the worst possible position in which to place the patient for the forceps operation in so far as the operator is concerned. The reason for this is that the stirrups hold the feet in the way of the operator, the buttocks do not project to the end of the table, the patient slips down easily when tractions are made, and the table itself is as a rule too high for convenient execution of the maneuver. The table, being usually on castors, moves with the tractions. It would seem wise that in hospitals conditions of the private house, particularly those of the better class, should be copied in the operating room in order that the student should learn to cope with the conditions which he will most probably meet in practice, and learn the technic of the operation under these circumstances. This can be done without

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a loss of aseptic technic and with a gain of success in the performance of the operation, as no table is better on which to do the forceps operation than the ordinary kitchen table with a blanket added, and covered with a sterile cloth and a Kelly pad; and no position of the patient is better for the execution of the operation than that with the Robb leg-holders which hold the legs well up in position and allow the buttocks to project over the edge of the table. For these reasons, it has been thought useful to incorporate some of the modifications and simplifications of forceps technic into a compact article by which the practitioner may be able to obtain a correct view of the simplicity and ease of doing the forceps operation with perfect asepsis and no evil results to the patient or her child. The operation, as taught in the various text-books, lacks definite detail and uniformity of execution.

*Indications for the Operation.*—A common indication for forceps is delay of advance of the head over a certain period of time; as, for example, two hours delay when the head is above the perineum and one hour when the head is upon the perineum. This is, of course, modified to some extent by the condition of the mother and child, but as an arbitrary rule, and inexact as most arbitrary rules are, it is a pretty fair one. However, with more experience in the care of labor, and a power of estimation or prognosis of the proper duration of that particular labor, forceps may often be applied when such time has not elapsed after the delay in the advance of the fetal head; forceps may be even correctly indicated when the head does not advance for a shorter time than that mentioned and *with failing pains*. And so considerable time may sometimes be gained in the total progress of the labor; thus, if the head rests upon the rigid perineum and if good pains are beginning to diminish and weaker ones result, it is often advisable to apply forceps sooner than when they are advised in the text-books. This is, however, a matter of the personal capability of estimating the probable duration of the labor and the power of expulsive force.

*Preparation for the Operation.*—The requisites of a good forceps operation in a house are an ordinary kitchen table padded with a blanket and covered with a sheet, a Kelly pad, a pail, a chair, and a footstool.

The proper dressing of the patient is a matter of some importance in the maintenance of rigid asepsis. The necessities are a number of sterile towels, some adhesive plaster, and a strong

elastic band. In addition, if the obstetrical bag provides a pair of leggings or cotton stockings, these are of some advantage. These cotton leggings are best made in the form of simple oblong open-ended bags 15 inches wide and 36 inches long. These bags are more convenient than those leggings which are shaped with feet, as they may be pulled on in any way and cover everything as well as the more elaborate ones. At the upper end, the seam should be left open for 15 inches, so that the ends may project over the abdomen.

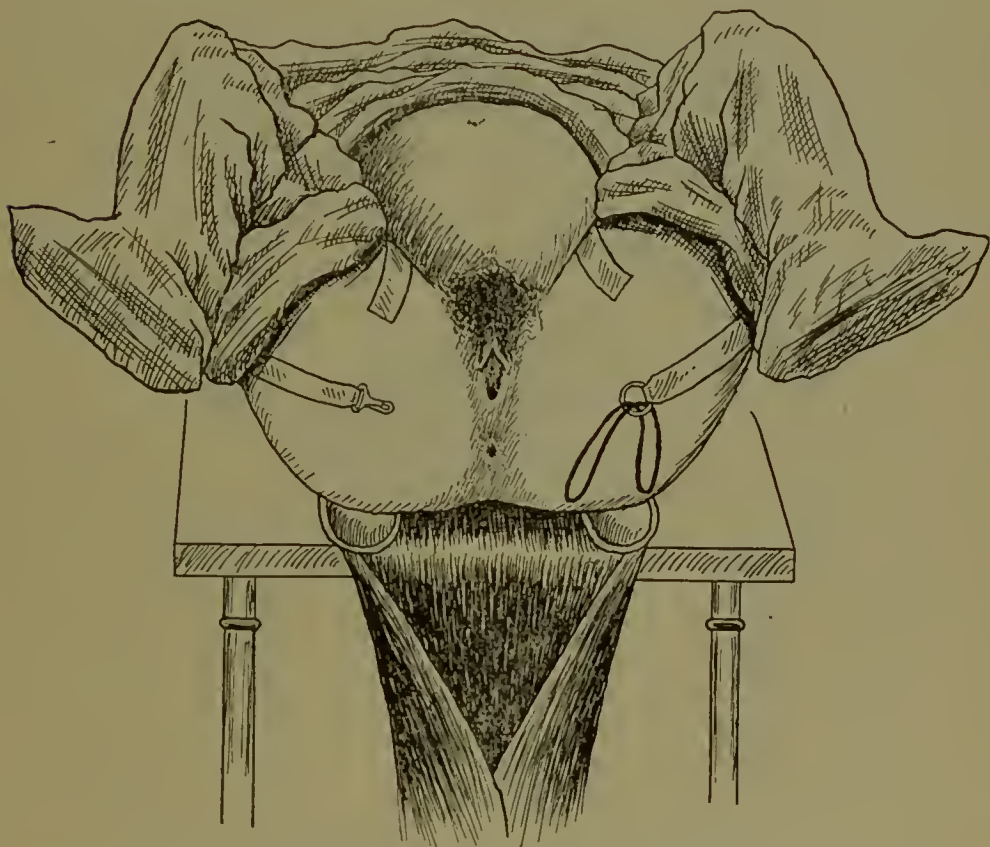


FIG. 1.—Dressing patient. Elastic band and adhesive strips.

Another useful aid to insure asepsis and to prevent contamination by discharges from the rectum is the use of a strong elastic band which passes across over one buttock to the other and is attached to two ordinary harness clips such as are used upon driving reins and which hold the towel in position below the vagina and above the anus. These snaps are held in position by two long pieces of adhesive plaster which pass around the thigh and which may be applied while the patient is in bed and before she is placed upon the table. The large rubber band is boiled with the forceps and may be readily placed in position



by the nurse or attendant while the towel is held in front of the field of operation, and allowed to fall over after the band is attached. This can be done after the vulva and vagina have been washed, and can readily be done without contamination of the towel. Instead of the towel a large piece of sterilized rubber dam or sheeting may be used and is very convenient for this purpose.

This elastic band has certain definite advantages over the common method of passing the bits of adhesive plaster across

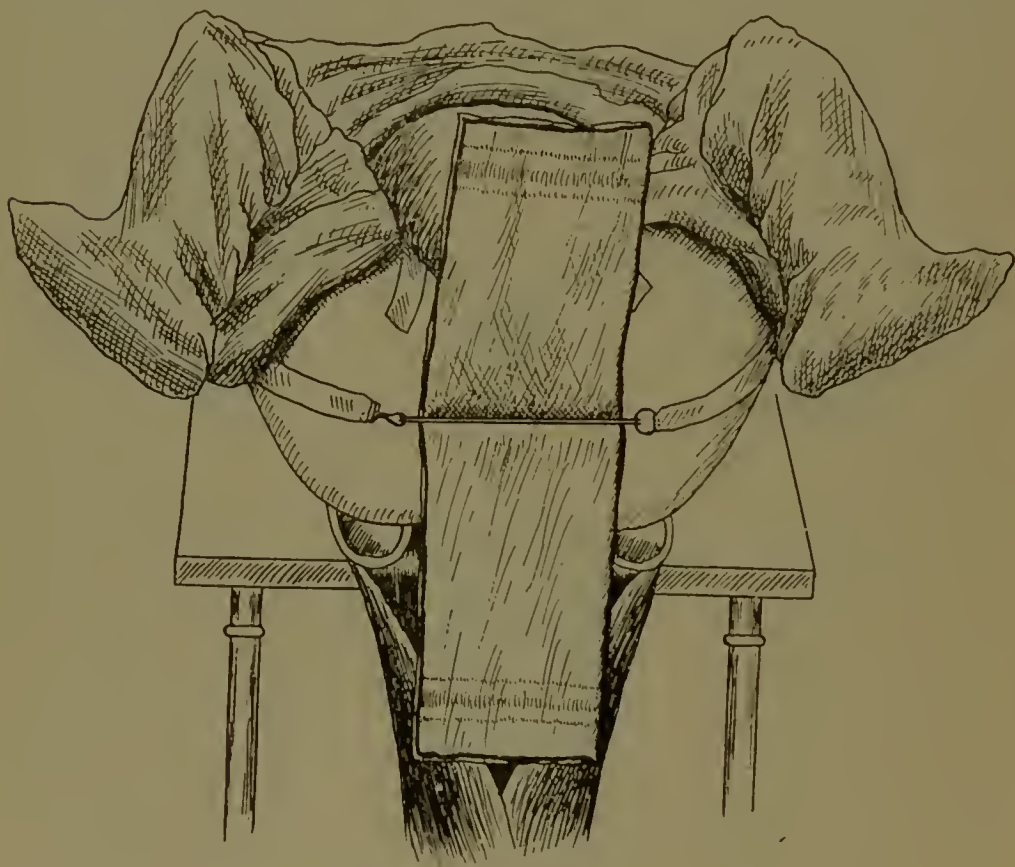


FIG. 2.—Dressing patient. Elastic band in position.

the buttocks to hold the towel in this position. When the adhesive plaster strip alone is used it must be applied after the patient is in position, on the table, which in itself is a matter of a little difficulty, and which being done by the nurse or attendant unaccustomed to it, under the direction of the operator, is seldom done well. And also when the tractions are made and the perineum bulges with the descending head, the adhesive plaster is torn away from the perineum and from its attachments so that a cup is formed between the buttocks and perineum and the towel which collects the discharges is a

source of inconvenience and may be a point of infection. With the elastic band, however, the towel is kept approximated to the perineum, all discharges flow over its surface, and, should it become soiled or soaked, the towel may be grasped and pulled away from the buttocks and a clean one dropped inside and held in position equally well, so that there is no fear of infection. The method of applying these towels may best be seen from the illustrations 1 to 5.

In the placing of the other towels it is well to put two side

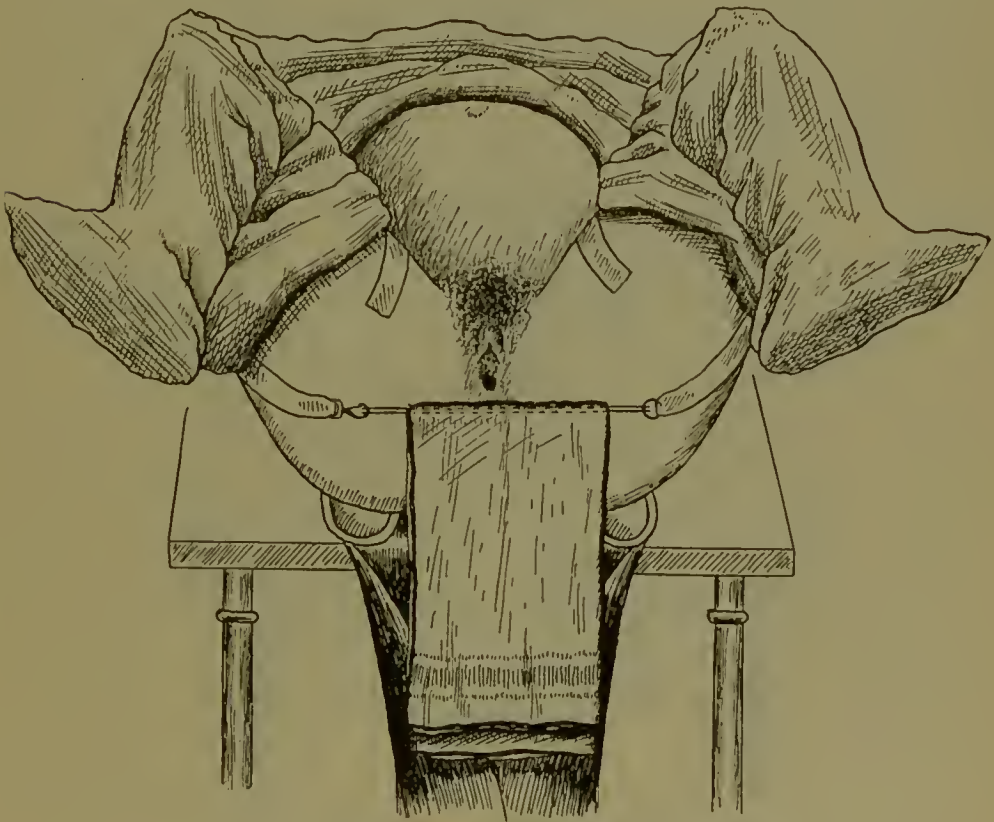


FIG. 3.—Dressing patient. Towel in position.

towels in position before the upper or top towel. In this way they do not slip down as they are held from doing so by the towel on top.

Patient is washed with ordinary soap and water and the vulvar hairs clipped before any attempt at dressing the patient is made. I usually do this myself with gloves on, washing the external vulvar parts very well with water into which a little green soap has been poured. I then wash the gloves in an antiseptic solution, slip then off and proceed to the operation without gloves.

The forceps should be placed conveniently at hand on a table or chair, and it is usually better to allow them to rest in an antiseptic solution. I use for this purpose a solution of 1-500 izar which is nontoxic and nonirritating and of strong antiseptic powers. They may rest in this solution as long as required before the time for operation. It is also necessary to have at hand before the operation is begun a hot douche which is also better made of an antiseptic solution. I use the same solution as that which covers the forceps for this purpose, a

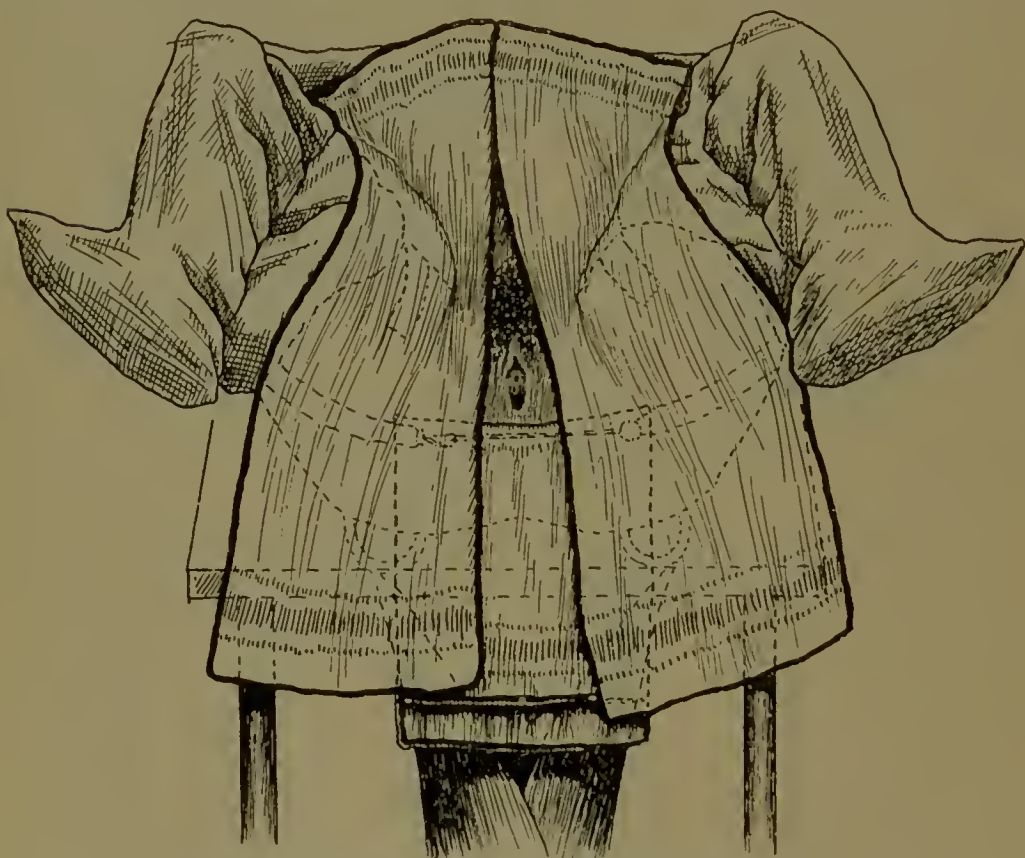


FIG. 4.—Dressing patient. Side towels in position.

solution of izar 1-500. This antiseptic is nontoxic and said to be many times more powerful than carbolic acid; it does not coagulate albumin and is very useful for obstetrical purposes. It has been used a great deal in Great Britain, and very good reports of its use in puerperal infection have come from Knyvett Gordon (*Jour. of Obst. and Gyn. for the British Empire*, 1907 and 1908, vol. xiv, No. 14), and Wilson (*Intercolonial Medical Journal*, 1909, May 25).

In making an examination before a forceps operation it is well that the labia should be held widely apart while the examining



fingers are thrust in so that the fingers do not touch the outside of the labial surfaces, for it has been proved that the outer labial surfaces are more difficult of cleansing and contain many more microorganisms than do the inner surfaces. It is also useful in making these examinations to employ a lubricant as the traumatism of thrusting in the dry hand may often in itself wound the mucous membrane. A useful lubricant for this purpose may be made from Irish moss, by boiling in water. Three ounces of Irish moss should be taken and washed in running

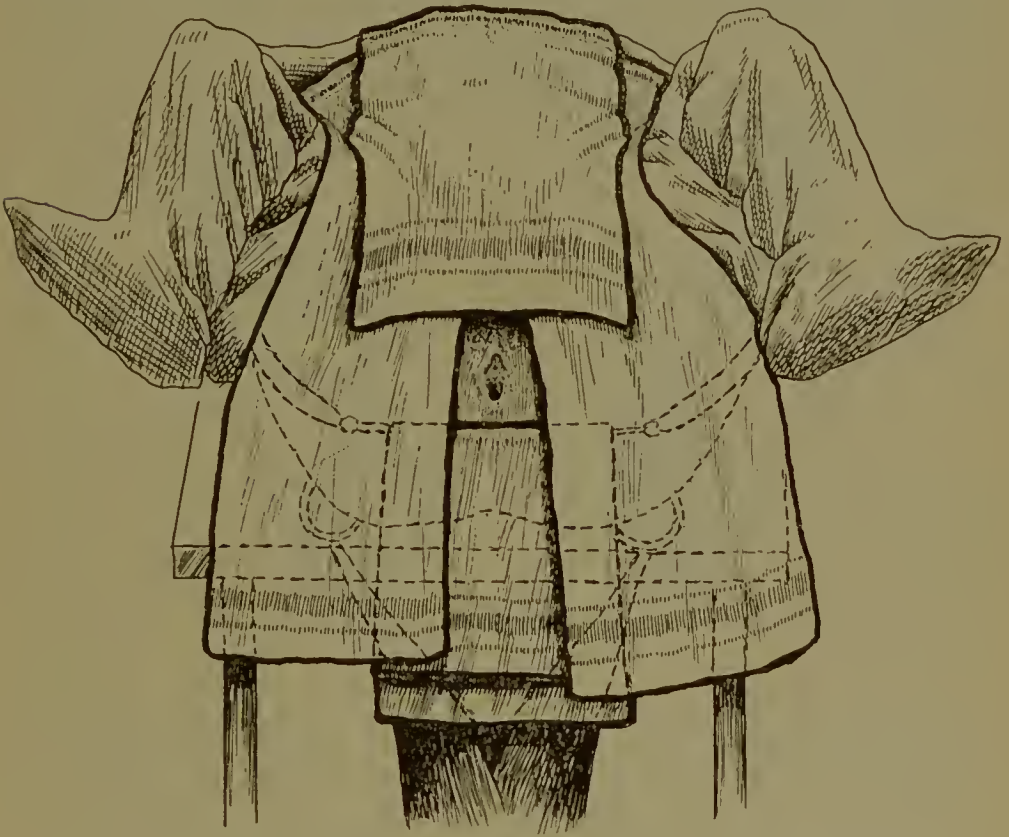


FIG. 5.—Dressing patient. Upper towel placed last to retain others in position.

water for a half hour. It should then be placed in two pints of water in a sauce pan and allowed to boil over a rather slow fire while constantly stirred. If it is not stirred it had better be put in a double boiler otherwise it will stick to the bottom of the sauce pan. After this has boiled for ten minutes it should be taken off and passed through a fine wire strainer such as is used in kitchens. If it does not flow readily through the strainer it may be expressed by means of rubbing a large spoon against the meshes of the wire. This strained jelly is again put upon the stove and sterilized by boiling for one-half hour with sufficient

water added to make it of the consistency of jelly. After one-half hour of boiling the jelly is taken from the stove and poured into lead paint tubes\* which have been previously boiled with their stoppers in another vessel. Before the jelly is poured into the tubes it is my custom to add to it the antiseptic, izal, in the proportion of 1 to 500 in order that the lubricant should have some antiseptic power.†

In making vaginal examinations before a forceps operation it is often useful, at the same time and even while the patient is going under her chloroform, to attempt to dilate the vaginal



FIG. 6.—Robb's leg holders.

orifice. This may be done by means of thrusting the entire hand into the vagina, or better by pressing down upon the perineum with the first and second fingers of the hand and massaging them from side to side. This will add considerably to the ease of delivery and at the same time when done with lubricant causes but little traumatism to the mucous membrane.

Chloroform is by all means the best anesthetic at present. Pregnant women bear it well, much better than the nonpreg-

\* These collapsible tubes may be obtained from the National Can Company of Detroit, and cost for the 1 x 6 inch size about three dollars per gross, or two cents apiece. The jelly costs about five cents a quart when finished.

† This lubricating jelly may be used for vaginal examinations in the office, or for lubricating catheters, etc. If it is required for this purpose, it is better in place of the izal to use some of the milder aromatic antiseptics such as thymol, gomenol 2%, etc., as a preservative. If it is desired to make the jelly clear and transparent it is better to add a large quantity of water and filter through muslin and later evaporate to the requisite jelly-like consistency. However, there is little advantage in going to this trouble in order to get a clear product as all that is required is lubrication and antiseptis.

nant, and come out of it easily. Chloroform should be given carefully to keep the patient under very lightly until forceps are applied, then the anesthesia should be a little deeper and when the head is upon the perineum and being delivered; the anesthesia is practically that required for minor operations. If there is any sudden loss of blood during the operation the nurse should be instructed to watch the pulse of the patient until the circulatory equilibrium has been restored. Ether is contraindicated in the forceps operation because pregnant women bear ether badly and suffer from respiratory irritation causing excess of mucus and stertorous breathing. The fetus is also affected by ether as is often observed in Cesarean operations where ether is used, and the fetus delivered under the influence of the anesthetic is difficult of resuscitation with an odor of ether upon its breath. Applegate of Philadelphia has reported to me in a personal communication that he had used spinal anesthesia with good effect, but in the present knowledge of this form of anesthesia it would seem wiser to wait for more complete reports before using it unless specially indicated. My experience with this form of anesthesia in other conditions would lead me to believe it the ideal anesthetic were its dangers removed.

*Choice of Instrument.*—The great factor in the success of the operation is the choice of the proper instrument. Very few students come from college with any knowledge of the advantages of the various types of forceps. First, the forceps should not be too long in the blades as are the forceps of the Simpson type. In forceps of this type when tractions are made on the head so that the head comes upon the perineum, and the tractions are then made in an upward direction, the blades which grasp the head over the parietal process pivot upon these processes and the tip of the blades projecting beyond the head impinge upon the pelvic floor and cause traumatism, often wounding the vaginal mucous membrane to cause the beginning of a perineal tear. This has been shown in a study of perineal injuries (McDonald, Lacerations of the Perineum, *Surgery, Gyn. and Obst.*, Jan., 1908) where a number of vaginal tears were begun in this way, and where it was noted that, as soon as the continuity of the mucous membrane was impaired, the stretching by the descending head caused small lacerations to increase in extent just as a small tear in a piece of cotton will readily extend. The muscle also in these cases often splits along the lines of cleavage to such a degree that, in one case reported



in that paper, there was a separation of planes of the muscle down to the skin in the sacro-iliac fossa. For this reason it is well to have the blades of the forceps as short as consistent with a firm grip of the head

Another disadvantage of forceps of the Simpson type is the width between the shanks. This often causes stretching and tearing of the fourchette before ever the head approaches the perineum. For this reason, the shanks between the blades and the lock, when the forceps is applied, should not be widely separated.

One requisite of good forceps is that they should be easy of application. For this the blades should not be too wide and the cephalic curve should not be too great. In order to obtain forceps which fulfill these requirements I have modified the Tucker-McLane solid-blade forceps in certain ways. These solid-blade forceps give the best satisfaction to those who are accustomed to its use and are well known and widely used in New York. The disadvantages of the Tucker-McLane solid-blade forceps are 1. the length of the blade which permits the points of the forceps to go down a little too far over the head of the child; 2. the tips of the blades approach too closely together, and 3. their tendency to slip off the head if not skillfully used.

With the idea of remedying these defects, I have shortened the blades, widened the tips, and caused a number of transverse fenestra to be cut in the blade (Fig. 7). The handles remain the same. These modifications cause the forceps to approximate more closely to the fetal head, to grip more firmly the parietal eminences which are the firmest part of the fetal skull, and they are not prone to slip off. The measurements of the forceps, as may be seen from illustration (Fig. 7) are, when the forceps are closed, 3.5 cm. between the tips. The bowl is 13.5 cm. in length. A very interesting proof of the correctness of this degree of division of the tips is that when the forceps are divided, as may be seen from the illustration, to the size of the average biparietal diameter, 9.25 cm., over which they would be naturally applied, the points of the forceps are separated 5.5 cm. In measuring the Elliott forceps and the Tarnier forceps, after the forceps under discussion had already been modified, it was found that when the forceps blades were separated to the size of a normal biparietal diameter, 9.25 cm., that the space between the tips of all three of these forceps measured 5.5 cm. In other words, three investigators—Tarnier, Elliott and myself—have independently



come to the conclusion that, with an average-sized head, the forceps tips should be separated 5.5 cm. If the points of the forceps are narrower then this undue pressure comes over the stylomastoid process and the tender facial nerve with an increased possibility of facial paralysis in the child.

The multiple fenestra do not detract from the strength of the forceps nor from the ease of application and add considerable to the gripping power to prevent slipping off the head. These semi-fenestrated forceps have an advantage over forceps of

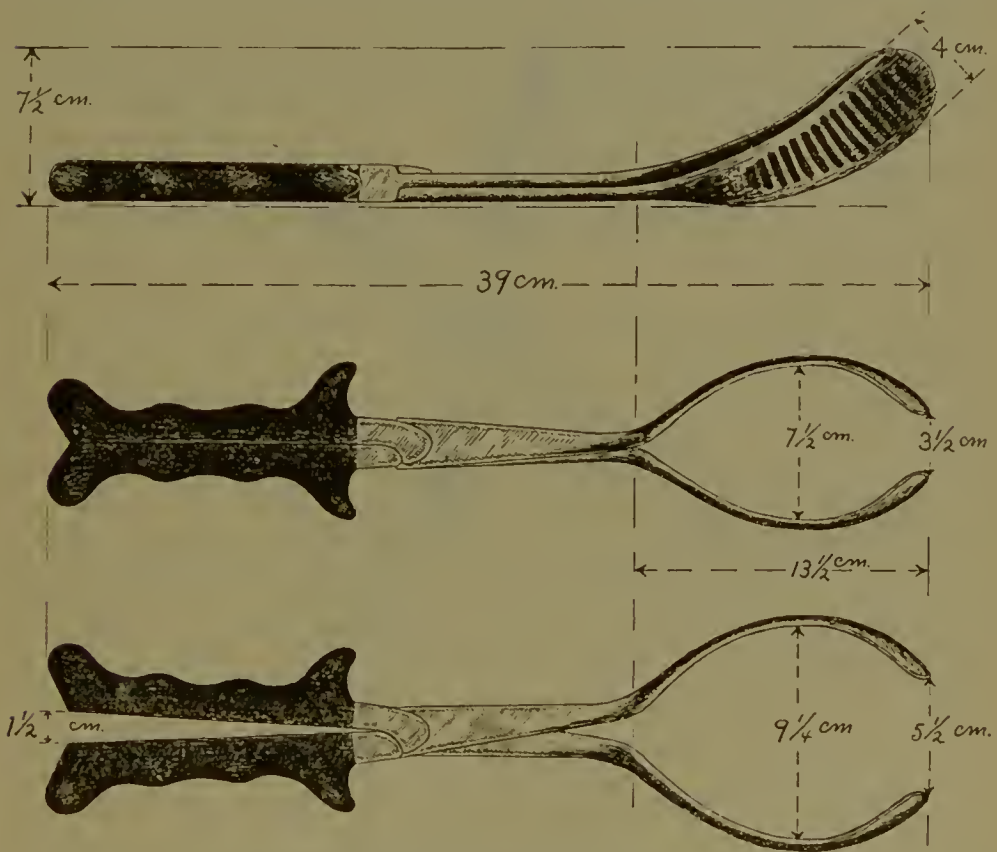


FIG. 7.—Author's semi-fenestrated forceps.

the Simpson or Elliott types in that the blades may be narrower and the pressure on the fetal head better distributed, with a lessened danger of tearing the ears or marking the child. These forceps have been in use with satisfaction since 1904 by a number of operators without, however, the multiple fenestra. This is a later modification to prevent slipping. In addition to the advantage of the shortened blade is the lessened possibility of pinching the cord against the head or neck with the tip of the blade. The blades, as modified, fit the head closely and were so made after more than a hundred fetal heads and measure-

ments had been investigated by means of casts and lead tape outlines.

These forceps have the advantage of ease of application because of the shortness and narrowness of the blades. They have all the advantages of the solid-blade forceps with the additional advantage which the solid blades have not, that there is little or no danger of slipping off the head.

*Application of the Forceps.*—The forceps operation should be divided for the purposes of classification into the operation 1.

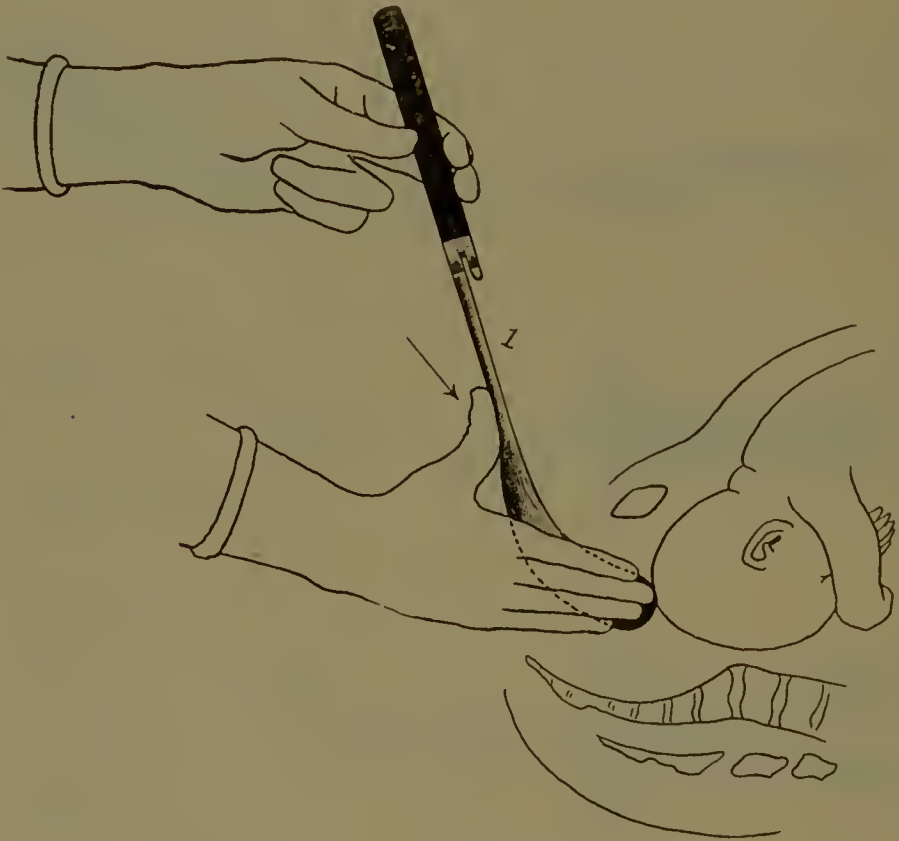


FIG. 8.—Head above perineum. First position. Against the head.

When the head is above the perineum, and 2. When the head is upon the perineum, as different methods of application are used in these different situations.

When the head is above the perineum the first two requisites before forceps should be attempted are that the cervix should be fully dilated, and that the head should be fixed at or in the pelvic brim. If the cervix is not fully dilated there will be grave danger of the possibility of] uterine rupture or cervical laceration into the broad ligaments, and forceps should never be attempted under any circumstances unless dilatation is complete.

If the head is not fixed, forceps cannot be successfully applied; as, for example, in the condition known as floating head, when one blade of the forceps is applied, the head moves before the other can be put in place so that the application is not successful and the operation is useless. Those cases in which a quick delivery is necessary with a floating head had much better be treated by version, for, if the head is floating, the uterus is usually relaxed so that version may be done, or the operation may be postponed until the head becomes fixed at the pelvic brim.

*Application of Forceps to the Head above the Perineum.*—When the application to the head above the perineum is made the

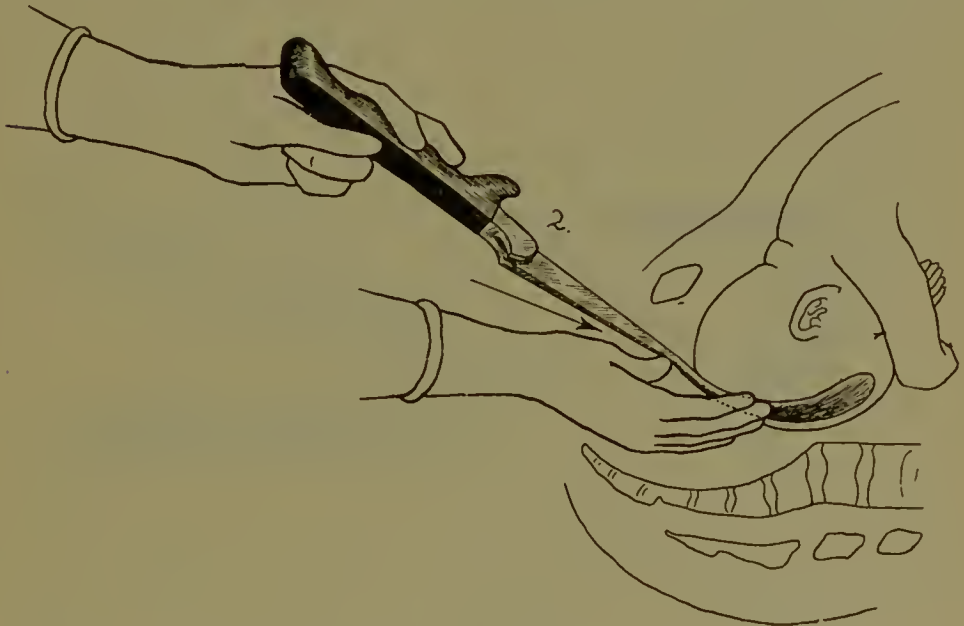


FIG. 9.—Head above perineum. Second position. Abduction of the blade and advance.

handle of the forceps is taken between the thumb and finger of the left hand while the right hand is passed into the vagina until it strikes the bulging curve of the fetal head. The forceps is then passed along the palm, the thumb being extended along the shank of the forceps. The handle of the forceps is held almost perpendicularly while the points of the blades are dropped down along the floor of the vagina until the point of the blade impinges against the head (Fig. 8). The handle is kept during all the time in the midline of the patient's body and not deviated to one or the other side. The advance of the forceps is obtained from pressure of the extended thumb upon the shoulder or shank of the forceps, in this way propelling forceps up along side of

the head. The forceps handle being held all the while in mid-line, the point of the blade is abducted so as to bring the point of the blade away from the midline of the child's head. The point of the blade driven by the pressure of the thumb upon the shank may thus be passed up along the side of the head so as to go almost into position. The handle of the forceps being held all the while in the mid-axial line of the patient's body (Fig. 9). The third movement of the forceps brings the point of the blade upward into the position over the side of the head while the handle is dropped downward toward the perineum.

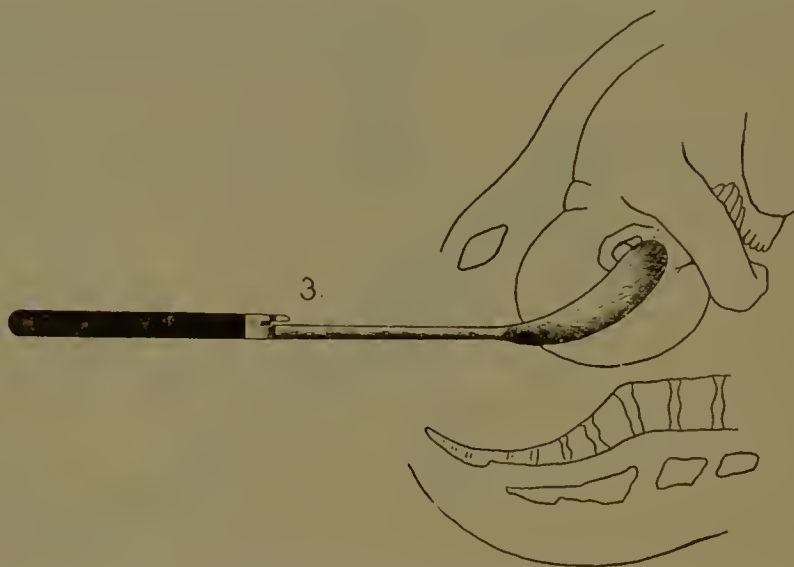


FIG. 10.—Head above perineum. Third position. Adduction of the blade and lowering of the handle.

The forceps thus rotates around a fixed point which is near the lower border of the symphysis at the entrance of the vagina. The application is done in three movements as may be seen from Fig. 11. The first position up against the head, the second abduction of the point of the blade and advance along side the head, and the third adduction of the blade by rotation of the handle which is at the same time lowered to the perineum. This method of application is taught by Winter in Germany and well taught in this country by James Markoe. They teach the method as a pelvic application. It, however, may be equally well adapted to cephalic application or application over the biparietal processes by means of a little additional manipulation. This method of application is difficult of description but can be readily demonstrated on the obstetrical phantom or over a round ball or bowl.

It is needless to say that a practical necessity to the proper



cephalic application of the forceps is a true knowledge of the position of the fetal head, and it is useful for this purpose to make abdominal examination early in every labor so that the position of the engagement may be known, as it is sometimes difficult to decide the position of the head by vaginal examination when the head is already engaged in the pelvis and when the scalp may be edematous.



FIG. 11.—Head above the perineum. Three positions.

The three movements of the application may be seen in Fig. 11. The second blade is applied in the same way and the forceps rotated to their proper position along side of the fetal head. The hand should be passed up to see that the cervix or cord is not grasped before traction is begun. If there has been a proper application in an average-sized head of 9.25 cm. biparietal diameter the forceps handles should, as may be seen from Fig. 7, be 1.5 cm. apart, that is the width of the middle finger. If there is a large head with biparietal of 10 cm. the forceps at the handles will be separated 2 cm., the width of the thumb. This way of estimation of the divergence of the handles gives some

idea of the correctness of the application. If the forceps are divided at the handle more than 2 cm. it is very possible that the proper cephalic application has not been obtained, as very few heads are of more than 10 cm. biparietal diameter. This is of considerable use in teaching the forceps application to students for, after the forceps have been applied merely by looking at the handles, it can be said whether the proper cephalic application has been achieved.

*Application to Head upon the Perineum.*—This method is not



FIG. 12.—Head upon perineum.

applicable to the second classification of the forceps—head upon the perineum—for in this condition the head occupying the lower part of the vagina and closely approximated to the perineum, the forceps cannot be inserted up against the head in the same way as in the other method. In this method the forceps are best passed in upon the under surface of the fingers and rotated around the head so as to bring them into proper position over the parietal eminence. The propelling force in this case also being the thumb extended along the shank of the forceps. This method of inserting the forceps by the thumb precludes any possibility of damage to the maternal soft parts as may occur if the blades are forced in by the grasp of the upper hand upon the handle as if the forceps were a spade or trowel.

*Method of Traction.*—The forceps then being in position, the operator should stand upon the right side of the patient, with his hip against the table or against the woman's buttock. If possible he should have a sterile gown, but if not he can guard against infection by means of two sterile towels pinned to his clothes. The left hand should grasp the forceps inside the locks and make pressure downward (Fig. 13); the right hand should grasp the forceps very firmly from below with the first two fingers coming up over the flanges of the locks and the other two fingers going over the handle of the forceps and down between their division. The right arm should be held firmly against the right hip and



FIG. 13.—Author's method of obtaining Pajot's maneuver.

then traction should be made in the direction of the pelvic curve until the head is upon the perineum and the occiput ready to pivot under the symphysis. The advantages of this position are that there is no danger of a sudden descent of the head causing it to tear the perineum. The amount of traction is controlled, there is no danger of the forceps slipping, and the blades of the forceps are not permitted to move upward or downward on the fetal head as the forceps are controlled in every direction. In addition to this, Pajot's maneuver or traction in the direction of the pelvic curve may be much better obtained because the right hand, which passes underneath the forceps, gives a lever of at least 12 cm. longer than if the right or directing hand were placed above the handle of the forceps as in the customary way. This is of considerable advantage in high operations, and Pajot's

maneuver obtained in this way so satisfactory that the semi-fenestrated forceps may be used for any of the operations for which the axis traction forceps are usually required. Instead of a lever of 4 cm., as is obtained when the right hand is placed above the handles as is commonly done, a lever 12 or more cm. is obtained when the hand is placed *below* the handle of the forceps, and much greater control of the blades and direction of the operation is achieved. An additional advantage of this grasp of the forceps is that the fingers of the lower hand curling around the handles pass in between the division of the handles and prevent undue compression of the head.

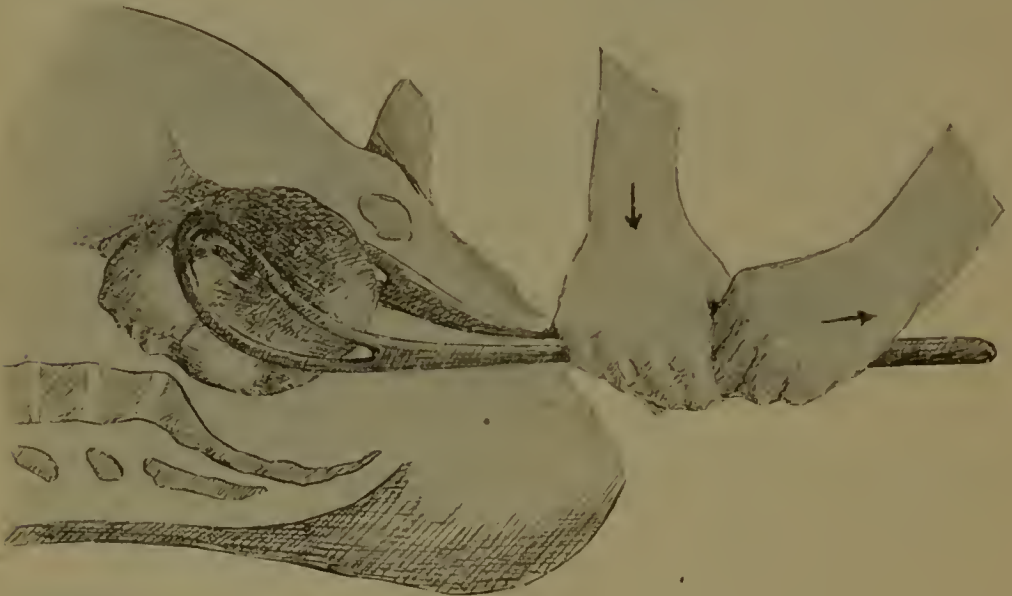


FIG. 14.—Usual method of obtaining Pajot's maneuver.

This method of making tractions will be found to have certain advantages over the others in control of the head and of the tractions. It will enable the high operations to be done without axis traction forceps, as the pelvic curve may be followed exactly. Of all bad methods of making traction, however, that of holding the forceps by one hand while the other is held against the head to note the amount of descent, is the worst. There is no control of the head or the forceps.

*Delivery of the Head.*—With the left hand above and the right hand beneath, traction in the direction of the pelvic curve should be made with the operator standing until the head is well down upon the perineum and the occiput ready to rotate under the symphysis. Then the direction of the traction is of course almost upward in relation to the table. Then the operator should



grasp the forceps by the locks with his left hand, holding the head in position, while he sits down and putting his foot upon the stool, he may by resting his elbow on his knee and by pressure of the finger tips bunched together through the protecting towel and between the anus and the coccyx, control the advance or return of the head while the forceps blades are removed one at a time with the left hand and passed upward on the sterile



FIG. 15.—Delivery of the head. Towels removed for the sake of illustration.

towels on the patient's abdomen. This method of control is shown diagrammatically with the towels removed for the purposes of illustration in Fig. 14. If the head cannot be at once controlled, the forceps should not be removed, but another traction or so made until control of the head by pressure of the fingers is obtained. When the head is thus controlled by the right hand through the perineum, the left hand should be placed

upon the occiput so as to control any sudden advance which may occur if the patient is imperfectly under the anesthesia.

When it is seen that the head can be perfectly controlled, it should be delivered slowly by pressing upward with the right hand against the child's forehead through the perineum, at the same time making efforts to gently push back the perineal ring around the head. It is often possible to push the anterior part of the perineal ring down over the occiput so as to allow the occiput to slip out from underneath the symphysis and to markedly increase the roominess of the perineum. This should be done by gently shoving back the perineum over the occiput and upper parts of the perineal ring. When it is seen that the head can be easily delivered more pressure may be put upon the fingers of the right hand and the head shoved out.

In this way the possibility of perineal laceration is much lessened, and there should be no more chances of perineal laceration with forceps than without forceps. In fact, most operators skilled in forceps delivery will say that there is less chance of perineal laceration with forceps than in the ordinary cases.

The advantage of having the foot on a stool is that the knee so forms a rest for the elbow and the arm does not become tired. An upturned bucket is a useful substitute for a stool.

It is always advisable to remove the forceps before delivery of the head as there is much less danger of perineal laceration by that method and it adds but little to the time of delivery. It is also true that in delivery of the head by the long forceps there is great danger from the pivoting of the forceps upon the parietal eminences, as before mentioned, causing the blades to impinge upon the perineal body and so cause a laceration. The delivery of the head after the forceps is removed, unless for special cases such as the weakness of the child, should not be hurried, but should be done slowly to avoid laceration of the perineum, extending over a time from three to fifteen minutes.

The ease and simplicity of the forceps operation depend upon a proper knowledge of the method of application and delivery. By the use of these methods, rigid asepsis may be practised and little injury done to the mother or child. The secret of successful forceps operation lies not in the muscles of the ox nor in the brawn of the bull, but in a knowledge of the proper direction of traction in the pelvic curve, a good instrument, gentleness and cleanliness.